JPRS 79642

11 December 1981

China Report

AGRICULTURE

No. 178

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 79642

11 December 1981

CHINA REPORT

AGRICULTURE

No. 178

CONTENTS

PEOPLE'S REPUBLIC OF CHINA

I. GENERAL INFORMATION

National

State Farm Forestry Conference Concerns Aired
(Lin Chu; ZHONGGUO NONGKEN, 24 Sep 81)........................ 1

State Farms Take Steps To Turn Losses Into Profits
(ZHONGGUO NONGKEN, 24 Sep 81)................................ 3

Xinjiang State Farms, by Mao Naishun
Fuijian State Farms, by Lei Yuxin

Export of Animal Byproducts Increased
(XINHUA, 28 Nov 81).. 11

Briefs
Changjiang River Soil Preservation 12

Anhui

Briefs
Huaiyuan Grain Production 13

Fujian

Study of Solar Energy Distribution, High Rice Yield Reported
(Cai Jinlu; FUJIAN NONGYE KEJI, 10 Aug 81)................... 14

Briefs
Xiapu County Agricultural Production 23

Guangdong

Huiyang Prefecture Aims for Economic Breakthrough
(Guangdong Provincial Service, 29 Nov 81)..................... 24

Heilongjiang

Briefs

State Farm Afforestation Statistics 25

Henan

Bumper Summer Grain Harvest for State Farms Reported
(Henan Provincial Farm and Land Reclamation Bureau;
ZHONGGUO NONGKEN, 24 Sep 81)................................ 26

Jiangsu

Briefs

Funing County Agricultural Harvests 27

Jilin

Meeting Focuses on Responsibility Systems
(Jilin Provincial Service, 24 Nov 81)........................... 28

Briefs

Tobacco Procurement 29

Liaoning

Briefs

Shenyang Grain, Vegetable Subsidy 30
Agricultural-Product Markets 30
Grain Procurement 30
Animal Products 30

Nei Monggol

Briefs

Grain Procurement 31
Privately Owned Livestock 31

Ningxia

Briefs

Bumper Summer Grain Harvest 32
Muslim Foodstuff Industry 32
Agricultural Output 32

Qinghai

Briefs

Madoi County Livestock Production 33

Shaanxi

Methods of Improving Soil Conditions Described
(Wang Li; SHANXI RIBAO, 27, 30 Aug, 3 Sep 81).................. 34

Briefs
Cotton Procurement Meeting 40

Shandong

Briefs
Huanghe River Diversion 41
Vegetable Harvest 41

Sichuan

Briefs
Yongchuan Prefecture Grain Production 42

Xinjiang

Briefs
Winter Wheat Sowing 43
Bumper Harvest 43
Huocheng County Excess Grain 43

Xizang

Herdsmen Overcome 'Extraordinary' Snowfall
(Liu Yinsheng, Xie Bangmin; XINHUA, 1 Dec 81).................. 44

Briefs
Forest Ownership Certificates 45

Yunnan

Briefs
Dali Bai Autonomous Prefecture Production 46

Zhejiang

Briefs
Lishui Prefecture Agricultural Development 47

ABSTRACTS

AGRICULTURE RESEARCH

HUBEI NONGYE KEXUE /HUBEI AGRICULTURAL SCIENCES/, No 10, Oct 81....... 48

FORESTRY

NANJING LINCHAN GONGYE XUEYUAN XUEBAO /JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS/, No 3, Sep 81.................. 51

I. GENERAL INFORMATION

STATE FARM FORESTRY CONFERENCE CONCERNS AIRED

Beijing ZHONGGUO NONGKEN [STATE FARMS AND LAND RECLAMATION IN CHINA] in Chinese No 9, 24 Sep 81 p 21

[Article by Lin Chu [2651 0443]: "Carry Out Readjustment Program To Hasten Forestry Development; North China Region State Agriculture and Livestock Farm Forestry Building Conference for the Exchange of Experiences Convenes in Heilongjiang Province"]

[Text] The North China Region State Agriculture and Livestock Farm Forestry Building Conference for the Exchange of Experiences was held from 21 to 28 July at the Jiusan State Farm Management Bureau in Heilongjiang Province. During the conference, delegates studied anew pertinent Central Committee documents, linking them to realities, and exchanged experiences in the building of forestry. They unanimously affirmed the achievements won in state agriculture and livestock farm forestry building. Forestlands owned by state agriculture and livestock farms in 13 provinces, municipalities, and regions of North China, the Northeast, and the Northwest alone amounted to 15,736,000 mu as of 1980. Of this total, 1,162,000 mu were shelter forest; 897,300 mu were timber forest, and 91,300 mu were economic forest. The remaining 12,833,600 mu consisted of scattered plantings of 99,215,300 trees. During the past several years, especially since the 3d Plenary Session of the 11th Party Central Committee, agriculture and livestock state farm implementation of the program of readjustment has strengthened the building of forestry, and the forested area has increased rapidly. In the 13 reclamation areas of North China, 1.59 million mu was afforested in the 4-year period, 1977-1980, 1.31 times the 1.21 million mu afforested area maintained in the 25 years preceding 1976. The steady increase in the forested area has improved the ecological situation in some units, and has promoted the development of agriculture. In units where the building of forestry got underway fairly early and where the area is fairly large, a certain amount of lumber and firewood has been obtained, and these units have also provided the country with a substantial amount of such diverse forest byproducts as fruits, medicinal materials, wood fungus, and mushrooms.

In the course of the conference, delegates zestfully visited the forest networks at three state farms of Keshan, Jianshan, and Daxijiang.

At the conclusion of the conference, comrades in charge at the Production Bureau of the Ministry of State Farms and Land Reclamation gave talks in which they expressed the hope that all jurisdictions would give attention to the following five tasks: Fist is the conscientious study of the three important documents of the CCP Central Committee and the State Council pertaining to the protection of forests and development of forestry, and the notice on active development of rural economic diversification, giving serious attention to plans of vital and lasting importance for the prosperity of succeeding generations. Second is intensification of natural resource surveys and the practice of forestry planning. The "65" forestry plan emphasis is on the building of farmland shelter forests, and secondarily on the adaptation of general methods to local situations to build firewood forests, timber forests, economic forests, and afforestation of the four besides [beside roads, streams, villages, and houses] in an organic combination of forest types. Concurrent with attention to afforestation and the operation of forests is the active development of comprehensive use of principal products and byproducts of forestry. Before 1985, the provinces of Liaoning, Jilin, Heilongjiang, Shanxi, Hebei, and Shaanxi should substantially have put into effect forest networks and planting of trees in residential areas. Despite the poor natural conditions in the western part of the three northeastern provinces, in northern Shaanxi, northern Shanxi, Nei Monggol, Xinjiang, Gansu, Qinghai, and Ningxia, forest networks and residential plantings should also be completed as soon as possible. Third is management of forestry through economic methods, promotion of a system of responsibility linking production to remuneration, and the building and perfection of a body of rules and regulations. Fourth is enhancement of scientific experimentation and promotion of advanced techniques to improve the quality of afforestation, to practice care and protection, and to steadily expand benefits from the building of forestry. Fifth is strengthening of leadership, and diligent implementation of the policy of "ownership to the afforester" in forest ownership. So long as the welfare of the state, the collective and individuals is taken into consideration, all measures that arouse the initiative of state farms, the collective, and individuals for afforestation may be adopted. In the execution of policies and the formulation of ordinances, state agriculture and livestock farms should take a leading role. They should unservingly carry out regulations for centralized and unified management of lumber, and firmly halt incidents of reckless timbering and denudation.

9432
CSO: 4007/73

STATE FARMS TAKE STEPS TO TURN LOSSES INTO PROFITS

Xinjiang State Farms

Beijing ZHONGGUO NONGKEN [STATE FARMS AND LAND RECLAMATION IN CHINA] in Chinese No 9, 24 Sep 81 pp 10-11

[Article by Mao Naishun [3029 0035 5293], deputy director, Xinjiang State Farm and Land Reclamation General Bureau]

[Text] Acting in the spirit of emancipation of thought, liberalization of policies, and enlivening of the economy, and implementing a series of policies including the assumption of responsibility for fiscal matters and expansion of the self-determination of enterprises put forward by the CCP Central Committee, Xinjiang state farm and land reclamation enterprises zeroed in on the issue of making up losses that have gone on for the last 10 years or more, carried out inquiries and reform and implemented a method of "making up losses through work."

Why did the Xinjiang State Farm and Land Reclamation General Bureau find it necessary to practice "making up losses through work?" This was because ever since 1967 when losses were incurred and despite large amounts of investment by the state to make up losses year after year, the losses persist. In the 3 years since the smashing of the "gang of four," though production has picked up, the loss situation continues to loom large. Two-thirds of the 168 agricultural and livestock farms and regiments in the state farm and land reclamation system show losses with losses in 1979 amounting to 108 million yuan.

Numerous reasons such as an irrational economic structure, poor administration and management account for the serious enduring losses of the state farm and land reclamation enterprises in Xinjiang Province. One major reason is that the growth of the workforce has far outstripped needs for the development of production with large numbers of excess workers greatly swelling the wage rolls. In the 11 year period, 1966-1977, the scale of farming and livestock production in the Xinjiang state farm and land reclamation enterprises has pretty much remained the same. The cultivated land area increased from 12,128,000 mu to 12,671,000, an increase of only 4.5 percent, while the labor force has increased from 547,000 to 731,000, an increase of 33.1 percent. Total wages for staff and workers increased from 254,440,000 yuan to 420,120,000 yuan, an increase of 65.1 percent. Regiments and farms have a surplus of 300,000 people, which annually cost a total of 200 million yuan in wages. This is a major reason losses are incurred.

Still another major reason for the enduring losses in Xinjiang state farm and land reclamation enterprises is the many years of neglect in repairing farmland water conservancy caused by destruction during the "10 years of catastrophe," which has brought about low and inconsistent farm output. The Xinjiang State Farm and Reclamation Area is an inland arid area where no water conservancy would mean no agriculture. For many years, the state farm and land reclamation system has built a series of water conservancy projects to divert water for irrigation. However, inasmuch as the irrigation ditches are long and a lot of seepage occurs, the water utilization rate averages only 50 percent. Moreover, seasonal water shortages are severe, and annually about 600 million cubic meters that are needed are not available, resulting in large areas of crops being decimated by drought. Between 1977 and 1979, the drought-stricken area annually amounted to an average 10.6 percent of the total area sown with the area decimated by drought amounting to 2.9 percent.

Unless the water problem is solved, even a higher degree of mechanization, greater amounts of chemical fertilizer, and better scientific farming will not bring good economic benefits. Furthermore, a system of responsibility for production is hard to implement; the enthusiasm of the masses for production cannot be aroused. Thus, the solution to the water problem has become the principal contradiction in the development of production.

So it is that two acute problems confront us. The first is a large amount of surplus labor lacking an outlet and occasioning the annual increase in payments of large amount of wages that increases losses. While we annually get more than 100 million yuan from the national treasury to make up these losses, we are only passively filling in the losses without making the most, in an active sense, of the funds used to make up these losses. Second is the many years of neglect in repairing water conservancy projects, and our not yet having effectively organized forces to effect overall repairs. It was in light of these aforestated problems that we put forward the method of "making up losses through work." The object was to organize the excess workforces, and, without increasing the investment by the state, to use the funds provided by the state to make up the losses, by making supplemental fund disbursements on the basis of how much labor was put into the capital construction of farmland water conservancy and the amount of work completed. This would change the conditions of production by putting into effect intensive farming which would form a good foundation for hastening the development of agricultural production, and bringing about an early turn around of losses to profits.

The specific ways in which we put into effect "making up losses through work" were as follows.

First, from the general bureau down to the state farm and land reclamation bureaus in each locale, "making up of losses through work" was made a major matter in reform of the state farm and land reclamation administration and management. Leaders divided up the work making specific persons responsible for it. Specialized management organizations to which planning, financial, capital construction, and material departments belonged were established.

Second, in the organization of workforces, each farming and livestock regiment and farm comprehensively put into effect the methods of "fixed contract rewards" and assigning responsibility for fiscal matters, and following the principle of making arrangements for both construction for present production and for long range construction. Fixed numbers of people and fixed sums of money were strictly allocated. So long as they guaranteed labor for building farmland water conservancy projects, the excess labor force could also be used to develop industrial sideline production and be organized into specialized teams for work inside their units or contracted for projects outside of them.

Third, in order to use manpower, materials, and finances flexibly and well, and to use a relatively small amount of investment funds to obtain fairly large economic benefits, we placed under unified planning and consolidated use all the funds that the state had allocated for capital construction of water conservancy, for making up losses, and for minor water expenditures [xiao feishui 1420 6316 3055]. Projects involving "making up losses according to labor" were, for the most part, labor intensive projects; wages for this came out of funds intended to make-up losses. Project materials and equipment costs came out of minor water expenditures. All consolidated funds used were disbursed project by project and according to progress shown, in implementation of the principle of "the more done the more given, the less done the less given, and nothing done nothing given."

Fourth, all the capital construction done by "making up losses through work" used capital construction management methods, with echelon by echelon management. Company size projects reported to regiments and farms for checking and verification, and regiment and farm projects reported to the state farm and land reclamation bureaus for checking and verification. Especially large projects that straddled regiments and farms reported to the General Bureau for approval. In addition, individual projects funded for more than 500,000 yuan reported to the General Bureau for checking and approval. Projects funded for less than 500,000 yuan were checked and approved by the state farm and land reclamation bureaus, with reporting for the record to the General Bureau as well. In order to assure construction progress and project quality, all projects that had been approved were assured necessary funds, materials, equipment, and transportation.

More than 1 year's experience has shown that "making up losses through work" not only put to purposeful use nearly 50,000 surplus workers, but also effected preliminary improvements in production conditions, and effectively advanced development of production.

In 1980, in a situation in which state investment in water conservancy and in water expenditures declined 35 percent from the 1979 figures, and the quantity of work completed increased 58 percent over the preceding year. A total of 1,033 kilometers of irrigation ditches were repaired to prevent leaks; 477 wells were sunk; 117 old wells were equipped; 5 small reservoirs, and nearly 800 kilometers of irrigation and drainage ditches were renovated. As a result of the work done on these projects, the volume of water increased by 200 million cubic meters, and irrigation on more than 60 square kilometers was improved to win remarkable results in economic benefits. Take the case of the gross output value of agriculture as an example. In 1980, it increased to 630 million yuan from the 554 million yuan of the previous year, an increase of 12.8 percent. Despite a 232,600 mu reduction from the previous year in the area sown, grain output exceeded that of the previous year, and cotton output rose to 695,700 dan from the 409,000 dan of the previous year, a 69.9 percent increase. Oil bearing crops increased from the previous year's 625,000 dan to 809,900 dan, a 29.5 percent increase. Sugarbeet output rose from the 234,000 tons of the previous year to 300,000 tons, an increase of 28.1 percent. While expenditures of public funds increased by 130 million yuan, losses declined from the previous year's 108 million yuan to 43.58 million yuan. The number of profitable farms rose from the 7 of 1977 to 51, and total profits rose from 2.36 million yuan to 43.27 million yuan. From the looks of the current production situation, state farm and land reclamation enterprises throughout the region will make the turn around from losses to profits in 1981. Numerous reasons account for these achievements, but a major reason has been the institution of "making up losses through work," which improved production conditions.

In the Guidun State Farm and Land Reclamation Bureau, where fairly good attention was given to "making up losses through work," the economic benefits have been even more striking. In 1980, they took 5.05 million yuan of "making up losses through work" funds, and 2,535,000 yuan for small water [project] expenditures, as well as 3.96 million of state-budgeted water conservancy investment funds, which were combined for use, and 8,000 people were then put to work on farmland water conservancy construction. In the course of a year, the following were completed: 2.93 million cubic meters of earth and stone moved and 9,878 cubic meters of mixed concrete poured on civil projects; 146 kilometers of plastic sheet leak-resistant ditches layed to increase by 9,000 cubic meters the volume of water diverted, and increase by 8.7 million cubic meters the amount in storage; reclamation of more than 30,000 mu of abandoned farmland. As a result of effectively improving production conditions, grain yields increased 40 jin per mu over the previous year, and cotton yields increased by 28 jin per mu. The area planted to wheat increased from the 210,000 mu of the previous year to 260,000 mu, and the area sown to cotton rose from 140,000 mu to 250,000 mu. As a result of the increase in production levels, a tremendous decrease occurred in losses in a rapid conversion of losses to profits. In 1979, losses fell from 23.38 million of the previous year to 15.60 million, and 1980 turned a profit of 156,000 yuan. In other regiments and farms too, a large number of representative examples also appeared of "making up losses through work," to change the production picture and rapidly convert losses into profits.

Experience has shown "making up profits through work" to be a good road for arousing the enthusiasm of enterprises and of staff and workers, for improving the conditions of production and for increasing economic benefits. During this present period of national readjustment, in particular, development of production depends not principally on expansion of capital construction, but rather on making the most of the role of existing enterpries on changing from extension to intension, and from extensive farming to intensive farming. "Making up losses through labor" fits in just fine with the requirements of this program.

Fujian State Farms

Beijing ZHONGGUO NONGKEN [STATE FARMS AND LAND RECLAMATION IN CHINA] in Chinese No 9, 24 Sep 81 pp 12-13

[Article by Lei Yuxin [7191 1342 2540]]

[Text] Since the implementation by Fujian's state farm and land reclamation enterprises of the programs and policies of the 3d Plenary Session of the 11th Party Central Committee, results from enterprise operations have undergone major changes. In 1979, state farms throughout the province removed the stigma of 22 consecutive years of losses, making profits of 560,000 yuan. Last year various forms of production on farms throughout the province reached all-time highs with profits of 5.84 million yuan, a 9.4 fold increase in profits over the previous year. Profit making farms increased to 86 from the 68 of the previous year. This amounts to 67.2 percent of all farms.

The growth situation for state farm and land reclamation enterprises in Fujian Province is very encouraging; however, development has been very uneven, and a great gap in the fruits of farming exists from one farm to another. In profitable farms, profit levels are fairly high, but in unprofitable farms, losses remain extremely heavy. This shows that a tremendous potential exists for increasing economic benefits. Why has such a situation occurred? It is because of the long term influence of "leftist" ideology on state farm and land reclamation enterprises when things were done without regard for economic laws or natural laws. In the wake of the 3d Plenary Session of the 11th Party Central Committee, some state farms took the correct road of running farms like enterprises, and very soon changes took place; other state farms were very slow in recoverying from the chaos and thus changes there were not great. The gap in farming achievements between one state farm and another is reflected conspicuously in production costs. To take the cost of several major products as an example, differences between one state farm and another were as follows: Highest cost per dan of paddy was 48.29 yuan; lowest was only 8.47 yuan. Highest cost per dan of tea was 385.54 yuan; lowest was only 68 yuan. Highest cost per dan of live hogs was 289.79 yuan; lowest was 57 yuan. The difference between highest and lowest cost of these goods was more than fourfold. Comparison of these figures raise for us an important problem requiring study, namely, why is there such a gap in production costs on Fujian farms?

In the course of survey, we discovered the following several problems:

First: The problem of how properly to put into effect a program of one dominant industry with diversified operations. Natural conditions on Fujian state farms are good and resources are abundant, but numerous farms have not paid attention to making the most of these advantages, losing economic benefits as a result. For example, the Tianma Citrus State Farm located in the hills has good conditions for growing citrus crops. However, in order to achieve grain self-sufficiency and solve the problem of getting meat to eat, they have used the land that is suited to the growing of citrus for the growing of grain and the raising of hogs. As a result, costs per dan of paddy are 14.1 yuan, and costs per dan of live pork are 153 yuan. Serious losses result in both cases. In another example, the Taicheng State Farm produces loquats for the most part; yet it cleared the hills to grow tea at a very great investment. Cost of producing a dan of tea is 370 yuan, and this also occasions very great losses.

Some Fujian state farms have made proper use of favorable conditions to develop production and win fine results. One example is the Fuqian State Farm. They have made rather good use of hills, water, forests and fields, carrying out a comprehensive development of farming, forestry, livestock raising, and sideline occupations in accordance with actual conditions at the farm. Ever since 1978 production has steadily climbed and product costs have constantly dropped; profits have increased year after year and the livelihood of staff and workers has constantly improved.

Comparisons show that for proper implementation of a program of one principle industry with diversified operations, it is necessary to stick to realities in starting out, do overall planning, use for farming what should be used for farming, for livestock raising what should be used for livestock raising, and for forestry what should be used for forestry in order to have a comprehensive development of agriculture, forestry, livestock raising, and sideline occupations, using a minimum of investment to win maximum economic benefits.

Second: The problem of how to find productive outlets for surplus labor. State farm and land reclamation enterprises in Fujian Province have 160,000 mu of cultivated land, and staff and workers numbering 71,000 people. There is an average 2.4 mu of cultivated land per worker, and costs of manpower amount to about half of the production costs. For the province's state farm and land reclamation enterprises as a whole, the labor productivity rate is 1,400 yuan, but it is only 420 yuan in low farms. On profitable farms where costs are low, the excess labor force has been made an issue. After Wan'an State Farm instituted a system of responsibility for production, a surplus workforce of more than 120 was organized according to their skills to work in diverse handicrafts and trades making metal fittings [nails, wires, bolts, hinges, locks, etc], processing rice-flour noodles, running small shops, tailoring, and barbering, and in this diverse work different forms of ownership were practiced. This both increased individual income and was a convenience for the masses, and saved 60,000 yuan in wages for the farm in a single year, while bringing in a profit of 10,000 yuan.

The Wan'an State Farm experience shows that in order to lower state farm production costs, it is necessary, first of all, to emancipate thinking, to get rid of the disturbance of "leftist" ideology, and to strive to explore the measures most beneficial for development of productivity and most favorable for increasing the work initiative and the standard of living of the people. It is necessary, second of all, to deal properly with the relationship among the state, the collective and the individual in distributions, using material and distributions to promote both enterprise and staff and worker concern for costs, and caring about cutting costs. Third is the need for equitable use of existing manpower, materials, and financial resources in order to get fairly large economic benefits from fairly small expenditures of labor.

Third: The problem of how to increase per unit yields. The effect of low per unit yields on production costs is very great. In 1980, Fujian's state farm grain yields averaged 1,087 jin per mu, but half the state farms had yields lower than this. Some state farms had paddy yields of 2,260 jin per mu, but state farms with the lowest yields had only 400 jin. Given the same investment and the same production costs, when per unit yields vary greatly, there is great disparity in the cost of goods. Jiangyang State Farm's tea yields are only 69.5 jin per mu as a result of which the cost per dan is 161 yuan, while the Shaowu Integrated State Farm's tea yields are 170 jin per mu, so costs per dan drop to 77.27 yuan. In the case of paddy rice, the Pingqi Agriculture, Forestry, Land Reclamation and Hatching State Farm's costs per dan of paddy are 21.59 yuan, the result of yields of only 400 jin per mu. The Xibin State Farm in Jinjiang County is located along the seacoast where soil salinity and alkalinity is very strong, yet their paddy rice is produced at a cost of only 9.30 yuan per dan, yields averaging 1,833 jin per mu.

The reason for Xibin State Farm's high per unit yields and low costs is the practice of scientific farming. First of all, was the increase of the soil utilization rate. Second was breeding of superior varieties to increase the single plant reproduction rate. Third was strengthening of fixed quota management to increase the labor productivity rate. The methods used by Xibin State Farm have general significance for all grain production. Only by earnestly taking these three tasks in hand can increase in yields per unit of area be fully realized.

Fourth: The problem of cost management. At this year's Fujian Provincial State Farm Work Conference, everyone acknowledged in the course of discussions that in economic work, the principal manifestation of the "leftist" ideology in state farms was the unrealistic pursuit of high quotas and bigness without concern for consumption and without calculating costs and blindly investing while cost management work was weak.

In order to strengthen cost management work, it is necessary, first of all, to eradicate the effects of "leftist" ideology, and advocate the seeking of truth in facts, a solid workstyle and strengthening of the planning function. It is necessary to build and perfect a series of management systems, particularly systems of responsibility for production and systems of responsibility for the management of costs by farm managers and technical cadres and make cost management permeate enterprise production processes and production links so that every department and every staff member and worker on state farms will be concerned about costs and take responsibility for lowering costs.

Recently a comrade in a leading organ of the Fujian provincial state farm and land reclamation [system] made some careful calculations as follows: Looked at in terms of product cost, when average cost per dan of paddy was 12.22 yuan, 78 farms were above the average. At an average cost per dan of 170.16 for tea production, 39 farms were above the average. At an average cost per dan of 96.40 yuan for live hogs, 72 farms were above the average. If high cost farms were to bring costs down to the average level, and low cost farms were to further lower costs, state farm profits throughout the province could increase several times over. Grain, tea, and hogs are the main products produced on the state farms. If average cost per dan of grain could be lowered to 11 yuan, income would increase 1.2 million yuan. If average costs per dan of tea were to be lowered to 160 yuan, an income increase of 500,000 yuan would be possible. If average cost per dan of live hog were reduced to 70 yuan, an increase in income of 2.6 million yuan would be possible. From these three items alone, the increased income would amount to 4.3 million yuan.

This accounting by Fujian state farm and land reclamation units was good. It was good in that it recognized the importance of reducing costs; it was good in that it strengthened consciousness of cost management; and it was good in that those who did it had a clear accounting in their brains. Were all jurisdictions and all levels of state farm and land reclamation units in the country to make such a conscientious accounting and do some thinking, cost management work in the state farm and land reclamation system would greatly decline, thereby making a greater contribution to the country!

9432
CSO: 4007/73

EXPORT OF ANIMAL BYPRODUCTS INCREASED

OW281514 Beijing XINHUA in English 1507 GMT 28 Nov 81

[Text] Beijing, November 28 (XINHUA)--China's export of many animal by-products including bristle, casing, honey and rabbit hair and meat tops the list in the world during the country's economic readjustment, said Cai Ziwei, vice-minister of agriculture in a recent interview.

Sharp increases in animal products between now and 1985 have been planned at a national conference on agriculture held last month, the vice-minister disclosed.

He noted that China produced 12.05 million tons of pork, beef and mutton last year, a four percent increase over 1978 and still fell far short of demand.

The government, he said, is systematically putting greater stress on animal husbandry. The total output value of animal husbandry climbed from the 13.1 percent of agricultural output in 1978 to 14.2 percent in 1980. But the percentage is to be further raised, with emphasis on fodder-feeding livestock, he said.

This plan is possible because with the new agricultural responsibility system, there is a surplus of manpower in the rural areas and there are 220 million hectares of grassland, 66 million hectares of hilly slopes suitable for grazing.

It was also decided that the suburbs of big and medium cities will make the production of milk, poultry, eggs and meat their major work. What's more, he said, efforts will be made to improve the breed and develop the breeding of valuable animals such as beaver, mink and musk deer.

The development of animal husbandry will improve the quality of people's diet and will bring more income to the peasants, he added.

CSO: 4020/40

BRIEFS

CHANGJIANG RIVER SOIL PRESERVATION--Shanghai, 23 Nov (XINHUA)--At a recent national ecology conference, 92 ecologists presented a six-point suggestion for improving the environment along the Changjiang River, which includes the establishment of a special office in charge of the work, soil and water conservation, afforestation, maintenance of dams, effective control of water pollution and scientific research and survey of the ecology along the river. At present 500 million dun of silt are washed down from the river to the ocean, causing soil erosion in 360,000 square km, about 20 percent of the area in the river basin. [Beijing XINHUA Domestic Service in Chinese 0143 GMT 23 Nov 81 OW]

CSO: 4007/112

ANHUI

BRIEFS

HUAIYUAN GRAIN PRODUCTION--Huaiyuan County in Anhui promotes diversified economy while increasing grain production at the same time. As a result, the total income from diversified economy this year is 110 million yuan, an increase of 50 percent over that of last year. Grain output in 1981 is 320 million jin more than that in 1980. The county is expected to deliver 350 million jin marketable grain to the state. [OW021325 Hefei Anhui Provincial Service in Mandarin 1100 GMT 30 Nov 81]

CSO: 4007/114

STUDY ON SOLAR ENERGY DISTRIBUTION, HIGH RICE YIELD REPORTED

Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 4, 10 Aug 81 pp 13-16

[Article by Cai Jinlu [5591 6855 4389] of the Fujian Provincial Meteorological Science Research Institute: "Distribution of Solar Energy and High Yields of Paddy Rice in Fujian"]

[Text] Between 90 and 95 percent of the biological products of paddy rice come from photosynthesis by the green tissues which convert solar energy into chemical energy. Therefore, the yield is determined by the rate of utilization of solar energy. To explore the question of the production and development of paddy rice and to analyze the characteristics of distribution of solar energy throughout the province are very important.

I. Characteristics of Distribution of Total Solar Radiation

Total solar radiation is derived by calculation via the establishment of empirical formulas. At present, the formula $Q = Q_0\ (a+b \cdot s)$ is generally used to calculate it. In the formula, Q is the total value of radiation of each month sought. Q_0 is the total radiation in the ideal atmosphere at each altitude, latitude and in each month. S is the percentage of sunshine of each month, a, b are coefficients. According to research by Wang Binzhong [3769 3521 1813] et al, it is believed that because Q_0 is the total radiation of the month in an ideal atmosphere at a certain altitude obtained from the annual average atmospheric pressure at the station to be calculated, the use of this formula can give the values of distribution of total radiation at different latitudes and altitudes, and computation is easy and reliable. We used actually measured data of solar radiation and the percentage of sunshine of each month in Fuzhou from 1960 to 1974 to solve for a and b, and then we calculated the total amount of solar radiation for each month and the cumulative value for the whole year at the 73 meteorological stations (posts) throughout the province according to the above formula. After checking the computations of the actually measured data at the Fuzhou and Longyan Stations, we found that the results and the actually measured values were very close. The greatest error for individual years was below 5 percent. The total amount of solar radiation at each locality was between 100 and 132 kilocalories/centimeter^2, and compared to the 133 kilocalories/centimeter^2 at Taizhong, the 116 kilocalories/centimeter^2 at Guangzhou and the 112 kilocalories/centimeter^2 at Hangzhou in neighboring provinces, the source of radiation in our province is relatively rich (See Diagram 1 and Table 1 for details). The time and space distribution is generally characterized by the following three characteristics:

(1) There is more radiation in the southeastern coastal regions than in the northwestern mountain regions. Because the altitude angle of the sun over the southern regions is larger and the weather is mostly clear, transparency of the atmosphere is better, the total amount of solar radiation received on the ground surface is more than that in the north. For example, the total annual radiation in Shaoan and Xiamen is over 125 kilocalories/centimeter^2 while that at Jianyang and Shaowu is below 105 kilocalories/centimeter^2. Basically, it drops as the latitude increases.

(2) The amount of radiation in regions at a lower altitude above sea level is greater than in regions at a higher altitude above sea level. Our province's mountain range system extends from the northeast to the southwest. It blocks and elevates the moist air from the ocean. In summer, the mountain region is mostly covered by convection clouds and rain. Therefore, the total solar radiation is less in the mountain regions at a higher altitude above sea level than in the plains at a lower altitude above sea level. For example, Yongchun at 188 meters above sea level and 25 degrees north latitude has a total annual solar radiation of 112 kilocalories/centimeter^2 while Jiuxianshan at 1,650 meters above sea level has only 102 kilocalories/centimeter^2. At 27 degrees north latitude, Fuan which is 45 meters above sea level has 108 kilocalories/centimeter^2 while Shouning at 825 meters above sea level only has 102 kilocalories/centimeter^2.

(3) Distribution over time is peak shaped. The distribution of total solar radiation at each locality over time is peak shaped. The highest radiation value is reached in July, the second highest value is reached in August, and then the amount of radiation begins to drop until January and February when it reaches the least value and it begins to rise again in March. This characteristic in distribution is related to the changes in the altitude of the sun and the evolution of atmospheric circulation. The trend of change is consistent with the change in atmospheric temperature and is favorable to agricultural production.

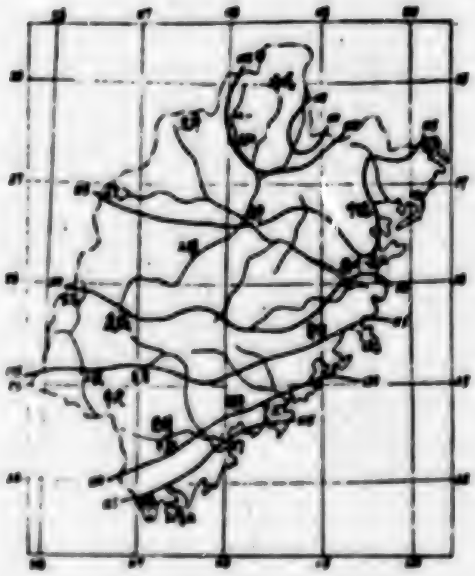

Diagram 1. Distribution of Total Solar Radiation in Fujian

Table 1. Monthly Distribution of Total Solar Radiation at Each Locality in Fujian (Kilocalories/centimeter^2)

表一

(1) 地点	(16) 海拔（米）	(17) 纬度	(18) 1月	(19) 2月	(20) 3月	(21) 4月	(22) 5月	(23) 6月	(24) 7月	(25) 8月	(26) 9月	(27) 10月	(28) 11月	(29) 12月	(30) 全年
(2) 东山	56	23°47′	8.4	7.5	9.3	10.2	12.7	11.9	15.7	15.1	12.5	11.7	9.1	8.6	132.7
(3) 厦门	63	24°27′	8.0	7.0	8.6	10.1	11.9	11.2	15.2	14.5	12.2	10.9	8.7	8.2	126.5
(4) 漳州	30	24°30′	7.5	6.4	8.2	9.4	11.2	10.1	13.5	13.4	11.4	10.1	8.4	7.8	117.4
(5) 晋江	21	24°49′	7.6	6.8	8.6	9.9	11.6	10.6	16.3	14.5	12.2	10.6	8.2	7.7	123.6
(6) 龙岩	341	25°06′	7.7	6.3	7.5	9.3	11.0	8.9	13.2	13.1	11.6	10.1	8.4	8.0	115.1
(7) 莆田	10	25°26′	7.3	6.2	8.0	9.3	10.2	9.7	13.0	13.5	11.2	9.4	7.4	7.1	113.2
(8) 福州	88	26°05′	7.0	5.7	7.6	9.1	10.4	9.7	14.4	13.8	10.7	8.7	6.5	6.2	109.8
(9) 三明	167	26°16′	6.4	5.7	7.3	8.9	10.8	9.4	14.1	13.7	10.8	8.9	6.8	6.0	108.8
(10) 宁德	31	26°41′	6.7	5.6	7.3	8.2	9.8	8.8	13.4	13.2	10.2	8.1	6.2	5.5	103.0
(11) 建阳	185	27°20′	5.9	5.2	6.9	8.5	9.6	8.8	13.8	14.1	11.0	9.0	6.6	5.5	104.9
(12) 永春	188	25°20′	7.5	6.3	7.8	9.0	10.4	9.1	13.4	13.1	10.9	9.4	7.9	7.6	112.4
(13) 九仙山	1650	25°43′	7.4	6.9	7.4	8.3	7.3	8.4	12.0	10.5	8.2	9.9	7.8	8.0	102.1
(14) 寿宁	825	27°32′	6.5	6.0	7.7	8.5	8.5	8.5	12.8	12.2	9.6	8.4	6.7	6.5	101.9
(15) 福安	45	27°09′	6.5	5.8	7.8	9.1	9.2	9.6	13.9	13.4	10.7	8.9	6.9	6.3	108.1

Key:

1.	Location	16.	Above sea level (meters)
2.	Dongshan	17.	Latitude
3.	Xiamen	18.	January
4.	Zhangzhou	19.	February
5.	Jinjiang	20.	March
6.	Longyan	21.	April
7.	Putian	22.	May
8.	Fuzhou	23.	June
9.	Sanming	24.	July
10.	Ningde	25.	August
11.	Jianyang	26.	September
12.	Yongchun	27.	October
13.	Jiuxianshan	28.	November
14.	Shouning	29.	December
15.	Fuan	30.	Whole year

II. Physiological Radiation and Productive Potential of Paddy Rice

The part of the radiation absorbed and utilized by photosynthesis in crops is called physiological radiation. Its amount as a proportion of direct radiation and scattered radiation is not the same. According to the computational formula proposed by Moerdawu [5459 1422 6671 3527], calculation of actually measured values of the two parts in Fuzhou shows each month, physiological radiation constitutes 48 to 50 percent of the total amount of radiation. This article used 48 percent in its calculations and a growth period of early rice in the original field from the day the daily average temperature steadily surpasses 15°C in ordinary years to 31 July, a growth period of late rice from 1 August to the last day the daily average temperature steadily surpasses 15°C in ordinary years, and a growth period of single season rice from 1 June to 30 September to obtain the following formula:

$$\begin{array}{l}\text{Total Physiological} \\ \text{Radiation of paddy} \\ \text{rice in the original} \\ \text{field (Kcal/mu)}\end{array} = \begin{array}{l}\text{Total Solar Radiation} \\ \text{During the Same Period} \times 48\% \\ (\text{Kcal/cm}^2)\end{array} \times 666.7 \times 10^4$$

According to the study by You Xiyu [1429 2448 3768], the coefficient connecting physiological radiation and biological yield is 10 percent. The economic coefficient of paddy rice is taken as 0.5 (actually measured number for si you No 2 and xian you No 6 is 0.49 to 0.61). The formation of each gram of dry substance requires 4.25 kilocalories of heat. Considering the effects of temperature during the panicle bearing and heading period of paddy rice upon the fruiting percentage, we must add a temperature adjustment coefficient (taking 0.8 for double season rice and taking 0.9 for single season rice because the temperature conditions are better during its panicle bearing and heading periods). In this way, we can obtain the potential value of light and temperature, i.e., the highest theoretical yield that is possible:

$$\begin{array}{l}\text{Highest theoretical yield} \\ \text{(Potential value of light and temperature in jin/mu)}\end{array} = \frac{\begin{array}{l}\text{Total physiological radiation} \\ \text{during the growth period in} \\ \text{the original field (Kcal/mu)}\end{array} \times 10\% \times 0.5 \times (0.8 - 0.9)}{4.25 \times 500}$$

The ratio between the light energy now accumulated in the economic yield at present and the total physiological radiation is the light energy utilization rate. Its computational formula is:

$$\begin{array}{l}\text{Light Utilization} \\ \text{rate (percent)}\end{array} = \frac{\text{Economic yield (jin)} \times 500 \times 4.25}{\begin{array}{l}\text{Total physiological radiation} \\ \text{during the growth period in the} \\ \text{original field}\end{array}} \times 100$$

According to this calculation of the physiological radiation and highest theoretical yield of double season rice and single season rice in the original field during the growth period, the actual yield and the rate of utilization of light energy in 1979, we can see the following: The highest theoretical yield of paddy rice in Fujian is from 2,260 to 2,930 jin for double season early rice, from 1,510 to 2,910 jin for double season late rice, from 3,090 to 3,600 jin for single season rice, 4 to 6 times the average yield of the whole province in 1979. At present, the rate of utilization of light energy throughout the province averages 0.85 percent for double season rice and 0.41 percent for single season rice. The productive potential for paddy rice is extremely great (See Table 2). In recent years, many small area high yielding fields have emerged everywhere. This also shows the possibility of increasing the rate of utilization of light energy by multiples. For example, in 1979, the experimental field of hybrid rice of Liming Brigade of Longhai County produced a total double season per mu yield of 3,204 jin, the rate of utilization of light energy reached 2.35 percent. The Agricultural Science Institute of Jianyang Prefecture planted an experimental field of hybrid paddy rice. The total double season yield per mu was 2,613 jin. The rate of utilization of light energy reached 2.7 percent. The Guangming Brigade of the Tangchuan Commune in Longxi County at an elevation of 840 meters above sea level planted single season hybrid paddy rice in 1977, per mu yield was 1,355 jin. The agrometeorological experimental station planted double season rice hong 410 in 1978, the total double season per mu yield was 1,412 jin, the rate of utilization of light energy was 1.43 percent and 1.48 percent respectively. A review of domestic and foreign record yields shows the rate of utilization of light energy is generally 2 percent to 2.5 percent, equivalent to about one-half the highest theoretical yield. We must never improperly belittle ourselves.

Table 2. Physiological Radiation, Potential Values of Light and Temperature and Rate of Utilization of Light Energy

表二

	(12) 生理辐射(千卡/亩×10^6)			(16) 光温潜值(斤/亩)			(17) 1979年产量(斤/亩)			(18) 1979年光能利用率(%)	
(1) 地 区	(13) 早稻	(14) 晚稻	(15) 单季稻	(13) 早稻	(14) 晚稻	(15) 单季稻	(13) 早稻	(14) 晚稻	(15) 单季稻	(19) 双季稻	(15) 单季稻
(2) 全 省	120~156	80~155	146~170	2280~2930	1510~2910	3090~3600	564	477	496	0.85	0.41
(3) 厦 门	156	155	170	2,930	2,910	3,600	641	610	317	0.86	0.22
(4) 龙 溪	146	143	155	2,750	2,690	3,280	616	556	366	0.86	0.27
(5) 晋 江	150	149	168	2,900	2,810	3,560	620	520	567	0.81	0.40
(6) 龙 岩	138	131	150	2,660	2,460	3,170	558	317	485	0.69	0.38
(7) 莆 田	138	135	154	2,570	2,540	3,270	698	606	563	1.02	0.44
(8) 福 州	136	124	156	2,560	2,340	3,300	695	661	529	1.11	0.43
(9) 三 明	135	116	153	2,550	2,170	3,240	500	435	520	0.79	0.44
(10) 宁 德	120	115	146	2,260	2,160	3,090	573	432	500	0.91	0.45
(11) 建 阳	126	80	153	2,360	1,510	3,230	446	437	449	0.91	0.48

Key:

1. Region
2. Whole province
3. Xiamen
4. Longxi
5. Jinjiang
6. Longyan
7. Putian
8. Fuzhou
9. Sanming
10. Ningde
11. Jianyang
12. Physiological radiation (kilocalories/mu x 10^6)
13. Early rice
14. Late rice
15. Single season rice
16. Potential value of light and temperature (jin/mu)
17. Yield in 1979 (jin/mu)
18. Rate of utilization of light energy in 1979 (%)
19. Double season rice

Because the potential for increasing the rate of utilization of light energy is still great, in the future, we must avoid blind reclamation and avoid the destruction of ecological balance to expand the area of planting paddy rice. We should seize high yields in the area of cultivated land presently available. Starting out from the actual production of paddy rice in our province, we should first grasp tightly balanced increases in production. The near term goal is to generally increase the rate of utilization of light energy by double season rice to 1.1 percent above that already reached in the Fuzhou area, increase that of single season rice to 0.6 percent above, then, per mu yield of double season rice can reach 1,350 jin and single season rice can reach above 750 jin. The long term goal should be to catch up with the high yielding fields of each locality and to increase gradually the rate of utilization of light energy to over 2 percent.

III. Main Measures To Increase the Rate of Utilization of Light Energy

Our province is situated in the subtropical zone, light and temperature resources are rich, rainfall is abundant, light, heat and rain occur in the same seasons, and the conditions for the development of paddy rice production are very superior. But, the level of large area production is not high. In 1979, the average per mu yield of double season rice reached only 19.8 percent to 27.5 percent of the highest theoretical yield. That of single season rice reached only 8.8 percent to 16.0 percent. The average per mu yield in Japan has already reached 30 percent to 40 percent of the highest theoretical yield. Now, we will take the data of the agrometeorological experimental base of the Tangchuan Commune of Longxi County from 1977 to 1979 as reference to propose several opinions.

(1) Rational distribution of double season rice and single season rice. For several years, we conducted paddy rice experiments at different altitudes above sea level in Longxi County according to a uniform experimental plan. The experimental results show that in regions at a lower altitude above sea level (Tuanjie, Huanglin), the growth period of paddy rice in the original field is longer (i.e., the time of photosynthesis is longer) and double season rice produces a visible increase in yield over single season rice. In regions at 800 meters above sea level (Tangzhou), the growth period in the original field shortens, double season rice does not produce a big increase over single season rice. In regions at about 1,000 meters above sea level (Daping), the growth period of rice crops is even shorter, double season rice does not produce increased yields, and when cold damage is encountered, "the two season rice performs more poorly than single season rice" (See Table 3). Therefore, in regions at high elevations, since the period of photosynthesis is short, the best sowing and transplanting times should be selected to adjust the key period during which paddy rice forms its yield (heading to maturation) in July and August when the sunshine is strong and the temperature is appropriate to increase the efficiency of photosynthesis and to seize high yields of single season rice. The actual measurements by the Tangzhou agrometeorological experimental station in 1979 showed that during July and August, the average intensity of sunshine of each 10-day period was 93,500 to 45,300 lux which could satisfy the needs for maximum efficiency of photosynthesis of the paddy rice colony, the monthly average temperature was 24.9°C to 23.4°C, exactly the most suitable temperature (20°C to 30°C) for photosynthesis but not reaching the most suitable temperature for respiration (30°C to 40°C), consumption was less, accumulation was plentiful, and high yields could be easily realized. In 1977, we planted an experimental field of single season hybrid rice of 88 mu at the Guangming Brigade at an elevation of 840 meters above sea level. Average per mu yield surpassed 1,000 jin, the secret of high yield was "competing for light." In regions at a lower elevation above sea level, double season rice produces more than single season rice, but we must not exercise "arbitrary uniformity." We should rationally arrange the proportion of double season rice and single season rice

according to the climatic and labor conditions of the locality of that year to strive towards reaching the highest total yield. Seventy-seven percent of the area of cultivated land of Tangzhou Commune are located higher than an elevation of 800 meters above sea level, 22 percent are located between 800 and 500 meters above sea level, only 1 percent is below 500 meters above sea level. Before 1976, double season rice constituted 24 percent, because the seasons were close together, field management could not keep up, thus worsening the degree of cold damage of paddy rice, and loss was serious. In 1977, the area of double season rice was adjusted to 10 percent, and as a result, total yield and unit yield of double season rice and single season rice all surpassed the historical levels. The total yield of food grains of the whole commune increased by more than 2,300,000 jin over 1976.

Table 3. Yields of Rice Fields at Different Elevations Above Sea Level and Rate of Utilization of Light Energy (Longxi County)

(1) 地点	(7) 海拔高度（米）	(8) 年平均气温（℃）	(9) 本田生长期≥15℃至<15℃（天数）	(10) 产量（斤/亩）				(15) 光能利用率（%）	
				(11) 早稻	(12) 晚稻	(13) 合计	(14) 单季稻	(16) 双季稻	(17) 单季稻
(2) 大坪	1050	14.6	165	684	304	988	987	1.20	1.20
(3) 汤川	840	15.7	184	862	270	1132	1021	1.19	1.19
(4) 下村	680	16.2	185	852	340	1193	1068	1.26	1.13
(5) 黄林	570	16.7	187	865	638	1503	1080	1.59	1.15
(6) 团结	126	18.8	214	913	635	1548	992	1.33	0.88

(18) 注：表中产量系由试验小区折算。大坪仅为1979年产量，其他点均为1978—1979年平均产量。品种，双季稻为红410，单季稻为杂交水稻。

Key:

1. Location
2. Daping
3. Tangchuan
4. Xiacun
5. Huanglin
6. Tuanjie
7. Elevation above sea level (meters)
8. Annual average temperature (°C)
9. Period of growth in the original field ≥ 15°C to ≤ 15°C (number of days)
10. Yield (jin/mu)
11. Early rice
12. Late rice
13. Total
14. Single season rice
15. Rate of utilization of light energy (%)
16. Double season rice
17. Single season rice
18. Note: Yields in the table were derived from small test areas. The yield of Daping was for 1979 and the others were average yields of 1978-79. Variety: Double season rice was hong 410, single season rice was hybrid paddy rice.

(2) Combination of geng and nuo rice varieties. Many medium and high elevation regions have poor heat conditions, frequently the phenomenon of cold damage of

double season rice "at both ends" occurs. If some geng and nuo rice varieties that have a stronger ability to resist cold can be combined suitably according to the concrete situation of the locality to serve as the "opening variety" of early rice and the "closing variety" of late rice, the period of photosynthesis "at both ends" can be fully utilized. According to observations by the Longxi County meteorological station, comparison of geng rice and xian rice showed a difference of 2°C to 3°C in the ability of cold resistance. For example, during the panicle bearing period and under the same low temperature of 20°C, liming (geng) has 18.5 percent less empty husks than hong 410 (xian). During the panicle bearing period under 20.3°C and during the heading period under a low temperature of 22.2°C, jialing (geng) has 31.9 percent less empty husks than hong 410.

(3) Scientific application of fertilizers and management of water. Utilizing fertilization and irrigation measures to enlarge the leaf surface area of paddy rice as early as possible and maintaining an appropriate leaf surface area coefficient and extending the time of photosynthetic functions are one of the keys to capturing fully the sun's light energy and realizing high yields. The method we used in our bumper harvest fields was: to apply fertilizers early for tillering after the plants have been transplanted and turned green, to apply nitrogen in a key way, to stimulate early growth and fast development so that the leaf surface area coefficient can reach five during the early period of young panicle differentiation. Then, we controlled fertilization and baked the field, and improved the condition of sunlight in the fields. During the period from panicle bearing to the full panicle stage, we sprayed nitrogen, phosphorus, potassium, molybdenum, boron and zengchanling [1073 3934 7227] over the leaves to prevent early withering of leaves, maintain a stronger ability of assimilation by the leaves so that the photosynthetic area during the yellow ripe stage can still remain at 2.5. In this way, per mu yield would all be about 1,200 jin.

(4) Development of winter planted crops. The average temperature of the coldest month of the whole province is 10°C to 12°C in southern Fujian and 5°C to 6°C in northern Fujian. From the time of harvesting late rice to the time of transplanting the 2d year's early rice, the winter fallow period is 110 to 150 days, cumulative temperature reaches 1,500-1,700°C, total solar radiation reaches 29-40 kilocalories/centimeter, and the fallow period of single season rice is even longer. This condition is suitable for planting such chimonophilous crops as broad beans, peas, rape, potato, and such green manure as astragalus. If we calculate the biological products formed by 2 percent of physiological radiation, the per mu yield of rapeseed (with an economic coefficient taken at 0.25) can reach 200 to 300 jin, the weight of fresh grass of astragalus can reach 7,000 to 10,000 jin. This is the most effective utilization of solar energy during low temperature seasons. It not only directly increases agricultural gain, it can also increase soil fertility "to use the fields to nurture the fields" and to promote continued high yields of paddy rice. The 20 mu of experimental fields of the Tangchuan agrometeorological experimental station originally was not highly fertile. Seedlings of rice planted frequently did not grow new leaves or roots after transplanting, and wheat had more difficulty growing. After the autumn harvest in 1977, the fields were prepared and leveled, broad beans, rape and potato were planted. In the winder of the 2d year, astragalus, rape, barley and wheat were planted. As a result, the soil became more and more fertile; the crops grew better and better. In 1979, per mu yield of rapeseed reached 235 jin, that of naked

barley reached 400 jin, per mu yield of single season hybrid paddy rice was above 1,100 jin. After the autumn harvest of 1980, the nutritional content of the soil of the plowing layer was measured. It contained 3.1 percent of organic substances, 52.8 ppm of hydrolyzed nitrogen, 1.8 ppm of immediately effective phosphorus, and 65 ppm of immediately effective potassium. The masses said in praise: "Planting green manure and rapeseed in winter is like a chemical fertilizer plant in the fields, the cost is low and the gain is large, it increases yield and it also increases profits."

9296
CSO: 4007/15

FUJIAN

BRIEFS

XIAPU COUNTY AGRICULTURAL PRODUCTION--Xiapu County, Fujian Province, has reaped a bumper agricultural harvest despite serious natural disasters. Its total grain output this year reached 160 million jin, topping last year's by 23 percent. [OW021325 Fuzhou Fujian Provincial Service in Mandarin 1120 GMT 29 Nov 81]

CSO: 4007/114

HUIYANG PREFECTURE AIMS FOR ECONOMIC BREAKTHROUGH

HK300657 Guangzhou Guangdong Provincial Service in Mandarin 2330 GMT 29 Nov 81

[Excerpt] Is it possible to achieve a new and comparatively big economic breakthrough in 3 years or so? The Huiyang Prefectural CCP Committee recently held a conference of 800 prefectural, county and commune cadres in Dongguan County, which gave an affirmative reply to this question and decided on practical measures for achieving this new breakthrough.

In order to make a success of this meeting, leading cadres of the prefectural CCP committee carried out more than 2 months of investigation and study in various counties, communes and brigades. On this basis, prefectural CCP committee secretary (Zheng Qun) delivered a report at the meeting on behalf of the committee, entitled "Clearly Understand the Excellent Situation, Enhance Revolutionary Spirit, and Strive for a New and Relatively Great Economic Breakthrough in the Prefecture in 3 years or So." The report analyzed the basis for achieving a new economic breakthrough and put forward the major measures to be undertaken. After full discussion, the 800 cadres attending expressed full agreement with these measures, holding that they were practical and concrete and could be implemented without any increase in state investment. These measures are as follows:

1. Speed up reform of the cultivation system and further readjust the agricultural production structure.

2. Popularize the best strains, so as to increase grain yields and make more land available for switching to industrial crops.

3. Special emphasis must be laid on helping the peasants to manage well their private mountains, and this must be regarded as the main method for greatly increasing people's income in mountain areas in the next 3 years or so.

4. Lay further stress on developing domestic sideline occupations under the new conditions.

5. Launch various kinds of joint economic undertakings in places which practice the system of handing overfull responsibility for task completion. These should be organized on the principle of voluntariness and mutual benefit and in light of local conditions.

6. Industry should closely cooperate to meet the needs of the new breakthrough in agriculture, by developing the processing industries and especially foodstuffs.

CSO: 4007/112

BRIEFS

STATE FARM AFFORESTATION STATISTICS--The Heilongjiang State Farm Administration has 9 state farm management bureaus, and 103 state agricultural and livestock farms subordinate to it. It has a land area of 92,396,000 mu and a cultivated area of 32,565,000 mu. Because of the many years of a lack of appreciation of the importance of forestry production, the artificially afforested area in 1975 was only 510,000 mu; erosion was extremely severe; windstorm, drought, and waterlogging disasters constantly occurred, and agriculture and livestock industry output was very inconsistent. Experience has made us gradually realize that without forestry there can be no stable agriculture; only through major efforts to plant trees for afforestation and the building of a fine ecological environment for agriculture can agricultural production steadily develop. The pace of afforestation has steadily quickened during the past several years, the artificially afforested area increasing by 770,000 mu between 1976 and 1980. This was equal to 1.5 times the artificially afforested area for the previous 25 years. In 1981, 822,385 mu were afforested in fulfillment of 164 percent of plan. [Excerpt] [Beijing ZHONGGUO NONGKEN [STATE FARM AND LAND RECLAMATION IN CHINA] in Chinese No 9, 24 Sep 81 p 22] 9432

CSO: 4007/73

BUMPER SUMMER GRAIN HARVEST FOR STATE FARMS REPORTED

Beijing ZHONGGUO NONGKEN [STATE FARMS AND LAND RECLAMATION IN CHINA] in Chinese No 9, 24 Sep 81 p 34

[Article by Henan Provincial Farm and Land Reclamation Bureau: "Triumph Over the Major Drought Disaster for a Bumper Summer Grain Harvest"]

[Text] Henan Province's 98 state farms have triumphed over this year's especially severe drought to win a heartening bumper summer grain harvest with total output exceeding last year's. Yields from a state farm summer grain area of 223,100 mu averaged 435 jin per mu, a 7 percent increase as compared with last year. Total output was 101.44 million jin, and despite a 2,700 mu cut from last year in the area sown, output totaled 5.7 percent more than last year.

From the 104,000 mu summer grain area on 5 state farms belonging to the province, which accounted for 44.4 percent of the province's state farm sown area, output totaled 53.4 million jin or 52.6 percent of total state farm output for the province for a 3.8 percent increase over last year. Yields averaged 514 jin per mu, a 5.2 percent increase over last year. The Huangfa District State Farm's 58,468 mu of summer grain, which has had consecutive yearly increases in grain output, had a 2.4 percent increase in per unit yields this year. Yields amounted to an average 556 jin per mu for an all-time high.

On the 129,200 mu summer grain area of 12 state farms belonging to prefectures and municipalities, yields averaged 372 jin per mu, a 9.1 percent increase over last year.

To win such a fine summer grain harvest in this year of an especially severe drought was by no means easy. Diligent implementation of the programs and policies that have ensued from the 3d Plenary Session of the 11th Party Central Committee, institution of various kinds of systems of responsibility for production, and diligent scientific farming was largely responsible for the good results.

9432
CSO: 4007/73

BRIEFS

FUNING COUNTY AGRICULTURAL HARVESTS--Funing County in Jiangsu has reaped bumper agricultural harvests this year. The total output of grain has reached 715 million jin, 50 million jin more than the 1979 record figure. The cotton output has increased by 80 percent and of oil-bearing crops doubled over that of last year. [OW021325 Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 28 Nov 81]

CSO: 4007/114

MEETING FOCUSES ON RESPONSIBILITY SYSTEMS

SK250848 Changchun Jilin Provincial Service in Mandarin 1100 GMT 24 Nov 81

[Excerpt] According to our sources, comrades participating at the meeting of party members and cadres at and above county level, which was sponsored by the provincial CCP committee from 20 to 24 November, conscientiously studied the guidelines of the national rural work conference and, in line with the realities of our province, emphatically discussed ways to solve questions concerning responsibility systems in agricultural production.

Since the 3d plenary session of the 11th CCP Central Committee and after implementing the documents of the CCP Central Committee on establishing responsibility systems in agricultural production, our province has made great progress in implementing responsibility systems in agricultural production. We have established responsibility systems in many aspects, developed the system of calculating payments in accordance with output and provided various forms of responsibility systems, thus arousing the enthusiasm of peasants and promoting agricultural production in an all-round way.

Comrades participating at the meeting conscientiously analyzed, on the basis of summing up the experiences and lessons of implementing responsibility systems in the past 2 years, the current situation of our province in responsibility systems, unified their thinking and clarified their tasks. They unanimously held: in view of the guidelines of the national rural work conference and the realities of our province, we face an arduous task of doing a good job in implementing responsibility systems in the coming winter-spring period. Readjustment needs to be made. We should work to establish, readjust and upgrade responsibility systems, responsibility systems should be established as soon as possible in units where such systems have not been established. Responsibility systems should be appropriately readjusted in units where the masses feel unhappy about the systems. No matter what form of responsibility systems is adopted, further efforts must be made to conscientiously sum up experiences to make continuous improvements. We should grasp responsibility systems as a central link in developing agriculture and consolidating and expanding the collective economy.

Comrades participating at the meeting enthusiastically discussed the question of how to establish and improve responsibility systems in agriculture. They unanimously held: the key to doing a good job in implementing responsibility systems is to suit measures to local conditions, proceed from realities, recognize the need to develop production and fully respect the autonomy of production teams and the desire of the masses. It is, therefore, necessary to establish different forms of responsibility systems in accordance with the economic levels of different production teams. A production team should be allowed to adopt various responsibility systems.

CSO: 4007/112

BRIEFS

TOBACCO PROCUREMENT--Jilin Province has reaped a bumper harvest of tobacco this year. By the end of October, the province procured 20 million yuan worth of leaf tobacco, an increase of 31.1 percent over the corresponding 1980 period. The province procured 34,600 dan of sun-cured tobacco and 194,000 dan of flue-cured tobacco. [SK280603 Changchun Jilin Provincial Service in Mandarin 1100 GMT 26 Nov 81 SK]

CSO: 4007/112

BRIEFS

SHENYANG GRAIN, VEGETABLE SUBSIDY--According to SHENYANG RIBAO, in accordance with statistics, the state has given Shenyang Municipality 150 million yuan in subsidies to make up for policy deficits in marketing grain, vegetables, meat and eggs. In other words, an average of 58 yuan has been given each person by the state. According to statistics compiled by grain departments, the state has sustained a loss of 0.1 yuan from selling 1 jin of grain and a loss of 0.8 yuan from selling 1 jin of soyabean oil. The deficits from selling grain are 100 million yuan. Based on the actual sales volume in Shenyang, the state has given 34.91 million yuan to compensate for deficits in marketing meat and 2.38 million yuan to make up for deficits in marketing fresh eggs. [Text] [SK010608 Shenyang Liaoning Provincial Service in Mandarin 2200 GMT 30 Nov 81]

AGRICULTURAL-PRODUCT MARKETS--The total business volume of the provincial agricultural-product markets in the first 10 months of 1981 was 677 million yuan, an increase of 41.9 percent over the corresponding 1980 period. The business volume of 12 main food items, including rice, soybeans, cereal oil, beef, mutton, eggs, chickens and vegetables, increased from 25 to 181 percent. [SK170558 Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 14 Nov 81 SK]

GRAIN PROCUREMENT--By 16 November, Liaoning Province had procured 3.81 billion jin of grain, an increase of 2.3 billion jin over the corresponding 1980 period. The annual procurement plan of oil-bearing crops has been overfulfilled. In view of the prosperous rural situation, commercial departments are transferring more industrial goods to the countryside. The province has decided to supply an additional 0.5 jin of edible oil and 1 jin of peanuts to urban residents during the new year's and spring festival. [SK222312 Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 21 Nov 81 SK]

ANIMAL PRODUCTS--Liaoning Province had overfulfilled the annual animal product procurement plan by 3.5 percent by the end of October. [SK240513 Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 23 Nov 81 SK]

CSO: 4007/112

BRIEFS

GRAIN PROCUREMENT--By the end of October, Nei Monggol had procured 495 million jin of grain, an increase of 130 percent over the corresponding 1980 period, and 320 million jin of oil-bearing seeds, an increase of 250 percent over the corresponding 1980 period. [SK060732 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 5 Nov 81 SK]

PRIVATELY OWNED LIVESTOCK--The Nei Monggol Autonomous Regional CCP Committee and people's government have comprehensively implemented the party's policies on agricultural development and relaxed the policy restraints on private-owned livestock following the convocation of the party's third plenary session. As a result, the number of livestock owned by individual commune members has increased rapidly in the past 3 years. According to statistics, the total number of livestock owned by commune members in the region now stands at 16.31 million head, a 48.5 percent increase over the 1980 figure and doubling that of 1979. Of the total number of the region's livestock, 40.5 percent are privately owned. Every commune household in the region owns 5.8 head of livestock on average. The ratio of draft animals to the total number of livestock has increased from 12.9 percent in 1980 to the present 14.9 percent. [SK102308 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 9 Nov 81 SK]

CSO: 4007/112

NINGXIA

BRIEFS

BUMPER SUMMER GRAIN HARVEST--In the wake of the continuation of last year's tremendous increases in summer grain production on state farms in Ningxia Province, another heartening harvest has been won again this year. Output from the 130,000 mu of wheat and the 7,000 mu of barley on 14 state farms totaled 59.2 million jin with yields averaging 432 jin per mu. Both total output and per unit yields showed a 13 percent and a 13.7 percent increase respectively over last year's all time highs. The amount of commodity wheat provided to the state increased from last year's 10.99 million jin to 15.28 million jin for an 85 percent fulfillment of the commodity grain plan quotas for the entire year. [Excerpt] [Beijing ZHONGGUO NONGKEN [STATE FARMS AND LAND RECLAMATION IN CHINA] in Chinese No 9, 24 Sep 81 p 34] 9432

MUSLIM FOODSTUFF INDUSTRY--Vinchuan, 17 Nov (XINHUA)--The financial department of the Ningxia Hui Autonomous Region has allocated 4 million yuan this year to develop a Muslim foodstuff industry, according to the department. The Ningxia Government has taken the step in an effort to meet the rising demands of the 1 million minority Muslim Hui people in the region. Four cold stores have already been built and bakeries and confectioneries have bought biscuit machines and microwave ovens. The cold store in Yinchuan, capital of the region, holds 1,800 tons of food. The government has also employed young Hui people in Muslim foodstuff factories and restaurants which have been equipped with vehicles and utensils. The government has also assured the industry's supply of four and edible oils [as printed]. In the first nine months of this year, Muslim bakeries and confectioneries in Yinchuan, where the Hui population is 30,000 produced 2,000 tons of products in 300 varieties. [Text] [OW190929 Beijing XINHUA in English 0745 GMT 17 Nov 81 OW]

AGRICULTURAL OUTPUT--In the wake of the implementation of the party's rural policies and the consolidation of the production responsibility system, the rural situation in Ningxia region has been good. There has been comprehensive development in agriculture, forestry, animal husbandry, sideline production and fishery. Production of grain and other agricultural products was increased over last year. In addition to bumper agricultural harvests, the region has also done well in afforestation. Some 890,000 mu has been afforested and some 100 million trees have been planted along the roads. As far as diversification is concerned, total income of the commune and brigade enterprises was increased by 12 percent each year from 1977 to 1980, and total income from household sideline occupations increased by 21.9 percent. Trade fairs were also busy in the region. The people's income in the rural areas was also raised. The people's average income in the rural areas last year was 152 yuan, an increase of 23 yuan over 1979. Due to a more stable livelihood, the masses have been more enthusiastic in promoting production and have shown more support for the party's principles and policies. [HK250937 Yinchuan Ningxia Regional Service in Mandarin 2300 GMT 17 Nov 81 HK]

CSO: 4007/112

BRIEFS

MADOI COUNTY LIVESTOCK PRODUCTION--Qinghai Province's Madoi County is increasing livestock production by implementing a responsibility system. Per capita income for Tibetan herdsmen from collectives is 475 yuan, up 12 yuan over 1980. This year the county has raised 150,000 young animals. [SK260620 Xining Qinghai Provincial Service in Mandarin 2330 GMT 25 Nov 81 SK]

CSO: 4007/112

SHAANXI

METHODS OF IMPROVING SOIL CONDITIONS DESCRIBED

Xian SHANXI RIBAO in Chinese 27, 30 Aug, 3 Sep 81

[Article by Wang Li [3769 4409]: "Soil improvement Cannot Be Abandoned"]

[27 Aug 81 p 2]

[Text] For our province's agricultural production to realize a relatively big breakthrough in the near future, the key is to use policy to mobilize the enthusiasm of the broad masses of farmers. At the same time, we must rely on scientific techniques to increase the per mu yield. Regarding scientific planting, we must work hard and persistently on this key link of improving the soil in order to solve the conflict between the crops and one of the fundamental conditions for their growth--soil--so that the soil will suit the demands of growth of the crops.

In recent years, many localities have gained a unilateral understanding of the nation's economic readjustment and allowing the farmers to rejuvenate themselves. They no longer emphasize changing the fundamental agricultural conditions and they place even less emphasis on improving the soil, and this is a grave mistake. Actually, improving the soil is the business of the farmers themselves; they improve the soil in front of their own houses, and this does not require investment by the state. As to allowing the farmers to rejuvenate themselves, according to my understanding, to demand dogmatically that the work that has to be done tomorrow or the day after tomorrow be done today is to be out of touch with reality. But not to do the work that needs to be done today and can be done is also a mistake. The correct attitude is to adhere to the principle of doing what one can as much as possible; that which should be done must be done, and it must never be abondoned. Some people also have said that, after implementation of the production responsibility systems of linking production to the laborer, contracting production to the families, and contracting work to the families, soil improvement can no longer be carried out. This is not right either. According to the experience of leveling and preparing the soil by the Duanjia Commune in Dali County, if the masses are clearly told the function and method of improving the soil, if the benefits of soil improvement are linked to the benefit of the masses themselves, and if the criteria of quality, time of completion, and reasonable wages are established, especially establishing one contract for a period of several years, and if the lots do not change, the masses will have long-range plans and they will do a good job of improving the soil of cultivated land they have contracted to work on.

Leveling and preparing the soil serve greatly to preserve moisture, soil and fertilizers. The loss of water and soil in our province is very serious. According to statistics compiled by the provincial bureau of water and soil retention, the province now loses about 43.7 billion cubic meters of water each year, constituting one-third of the annual rainfall in the whole province. Each year, the province loses about 900 million tons of soil containing 250,000 tons of pure nitrogen, 350,000 tons of pure phosphorus, and 4.4 million tons of pure potassium. The plant humus that is lost is even greater. Because of the loss of water and soil and the problems in work over many years, the reduction of organic matter in our province's soil is very serious. In Qishan County, in 1963, the soil contained 1.4 percent organic matter, while, in 1977, this dropped to 0.9 percent. In Wugong County, this also dropped from 1.22 percent in 1958 to 1 percent in 1980. In Qianyang County, at present the area of soil below 20 centimeters with an organic content of 0.8 percent to 1 percent constitutes 30 percent of the total area of cultivated land and the area of soil with an organic content of 0.6 percent to 0.8 percent and 0.4 percent to 0.5 percent constitutes 35 percent of the total area of cultivated land. The organic content of the soil in the northern Shaanxi region is below 0.6 percent. As the masses in northern Shaanxi have said: "The Yellow River flows toward the east, carrying away food grains and oil."

Of course, controlling the loss of water and soil does not mean just leveling and preparing the soil and building horizontal terrace fields and terrace land; it also requires massive afforestation and planing of grass in the broad regions suitable for afforestation and livestock production, or planting methods that retain water and soil. But in the flat land in Guanzhong and the plateau north of the Wei River, in the hilly ravine regions of northern Shaanxi and the gentle slopes of the mountain regions of southern Shaanxi, leveling the land, building horizontal terrace fields and stone ridge terrace fields are important measures of farmland capital construction and preserving water and soil. The experience and lesson in this regard are profound. Sufang Commune of Wugong County used over 200 cubic meters of water per mu every time it irrigated because the land was not flat and because of massive flood irrigation practices after the Jixia Canal began transporting water. A few years later, the underground water level rose, the exposed water surface area reached over 380 mu. It seems that, after leveling cultivated land that is generally level but not absolutely flat, small border irrigation or furrow irrigation and shallow irrigation can be used. This can greatly conserve water and also can achieve the scientific use of water. It also can prevent the soil from becoming hardpan, salinized and alkalized, or from becoming swampy.

Leveling the land is more important in dry land regions than in mountain land that slopes gently. It can fully utilize rainfall so that new rain can evenly filter into the ground, reducing and even avoiding loss by runoff, and preserving soil, preserving water, and preserving fertilizers. Building horizontal terrace fields in the hilly ravine regions of northern Shaanxi can change "three runs" into "three preservations", and the results of increased yields will be visible. According to typical surveys, the per mu yield can be increased from 40 - 50 jin on slopes to over 100 jin. Building stone ridge terrace fields and terrace land in mountain regions of soil and rock in southern Shaanxi can prevent washing by torrential rain water, preserve water, preserve soil and preserve fertilizers, and increase the yield if the rock laying is done well. We cannot blame the masses of Zhenan County who called these fields "rock ridges, gold rice bowls."

Regardless of whether it is leveling the land or building terrace fields and terrace land, they must all use the effective method of reversal and preserving mature soil. After leveling, it is best to apply sufficient organic fertilizers and phosphorous fertilizers to ensure that the land leveled that year will produce an increased yield that year and to avoid reduced yields for several years because the surface soil becomes immature.

[30 Aug 81 p 2]

[Text] Deep Upturning of the Soil, Improving the Physical and Chemical Functions of the Soil

Leveling land can only change its shape; only deep upturning can improve its physical and chemical functions.

People often say: "The roots must be deep for the leaves to grow prosperously". "The roots must be deep" before "the leaves can be prosperous," the stems thick, the spikes large and the grains full. The advantage of the land after leveling, preparing, and deep upturning combined with sufficient farmhouse manure applied during deep upturning are that the hardpan plow layer can be broken; the active soil layer can be deepended; and there can be an increase in the granular structure of the soil, the water permeability and aeration of the soil, the ability of the soil to store water, and the propagation and activity of microorganisms, stimulating the decomposition of mineral fertilizers and plant humus from a state in which they cannot be absorbed to a state in which they can be absorbed by plants.

According to measurements taken by the provincial Agricultural and Forestry Sciences Academy, the same amount of rainfall in a soil layer of 5 cun to 1 chi produces a water content of 19.8 percent in soil upturned 5 cun, and 21.5 percent in soil upturned 1 chi. In the soil layer of 1 chi to 1.5 chi, the water content in soil upturned 1 chi is 28.8 percent, and in soil upturned 1.5 chi is 21.5 percent. Also, according to measurements of the sowing period of what showing the number of aerobic bacteria in each gram of soil, in the 1.5 cun soil layer, there are 954,000 bacteria in the soil upturned 5 cun, and 1.191 million bacteria in the soil upturned 1 chi 5 cun, an increase of 24.8 percent. The number of nitrifying bacteria is most outstanding. Soil upturned 1 chi 5 cun contains 4,231 bacteria, an increase of 93.9 percent. This is similar to what Comrade Mao Zedong said: each granular structure of the soil after deep upturning is like a small reservoir, a small fertilizer warehouse; large granules are large reservoirs and large fertilizer warehouses. The soil, after deep upturning, has a broken hardpan plow layer, the moisture and fertilizers are increased, and the root system of the plants develops naturally.

According to measurements made by the Northwest Biology and Soil Research Institute, the amount of roots in a soil layer of 3 chi deeply upturned from 8 cun to 1 chi is 24.5 percent more than the amount in soil upturned 5 cun. Deep upturning also can stimulate the root system to develop downward. Also, according to measurements taken by the provincial Agricultural and Forestry Sciences Academy, during the period of returning green of wheat showing the amount of roots below 6 cun, the amount of roots in soil deeply upturned 1 chi 5 cun is 13.4 percent more than the soil upturned 5 cun. The deeper the roots, the more nutrients and moisture of the deep soil layers can be absorbed, and this is more beneficial to the growth of the stems and leaves aboveground. Also, deep upturning can remove weeds and eradicate insects.

The method of deep upturning of the land can be done manually, by draft animals, by machine, or by a combination of man, animals, and machine. As farm machinery develops, we can gradually realize machine upturning of soil. The depth of upturning can reach 1 chi 5 cun in the Guanzhong region where the soil layer is thicker. The depth can be shallow in the mountain and sandy regions where the soil is thinner, most suitably to the bottommost layer of unseen soil. [BUJIANTU 0008 6015 0960] No matter which method is used to turn the soil, it is most important not to mix up the soil layers, the mature surface soil should still be kept on top; in deep upturning, a sufficient amount of farmhouse manure, phosphorous fertilizers and stalks returned to the soil or compacted green manure should be applied in the bottom layers of immature soil layers so that organic substances will gradually increase as the substances applied in the soil rot, thus increasing the soil's granular structure and causing the immature soil layer to mature and to become fertile.

Combined with deep upturning, we also can apply nitrogen, phosphorus, and potassium in appropriate proportions based on analysis of a general survey of the soil. Where conditions are favorable, we also can apply necessary trace elements, such as zinc and boron. In regions of Keshan disease, we also should apply an appropriate amount of sodium selenite to adapt to the needs of the crops. Generally speaking, soil upturned deeply once retains water permeability and aeration for 3 years. Therefore, each year, during the fallow period, one-third of the land can be upturned and tilled, and this can be rotated for 3 years to complete one deep upturning of the soil. The time for deep upturning, in the experience of such communes as Fuliu Commune in Heyang County, should be the summer fallow period after summer harvest to take advantage of the presence of moisture for deep upturning. The so-called "cup of oil during the first summer upturning of the soil, half-cup of oil during the second summer upturning of the soil, and drops of oil during the third summer upturning of the soil" shows early deep upturning of the soil in summer is better than late upturning. Winter fallow land also should be deeply upturned after autumn harvest to take advantage of the presence of moisture. Early upturning allows more time for the soil to store rain water and for the roots, stems, and leaves of plants to rot; and the soil can mature and become oily during the hot summer and cold winter. The best upturning is after rain, with the presence of moisture helping to avoid burying a foreign base in the soil. After upturning, the soil should be immediately raked and smoothed to preserve moisture until sowing. The soil should be raked and smoothed once after every rainfall to reduce evaporation of moisture and to facilitate the storing of rain water during summer and autumn for use in winter and spring.

[3 Sep 81 p 2]

[Text] Use and Nurture the Soil, Improve Fertility of the Land

The problem of infertility and weak fertility of the soil has gradually been recognized. At present, many places have already emphasized rational reverse cropping to use and nurture the land and to cultivate land fertility.

The function of alfalfa to fertilize the land is well known. Although the area of alfalfa in our province has not yet returned to the historical record of 2 million mu, it has increased from the 1,721,500 mu in 1978 to 1,863,400 mu in 1980. Some other places have planted rape and corn in alfalfa fields. These are all welcome beginnings.

Peas also are good and well-known reverse crops. In our province's history, they once covered 6.56 million mu. Now, there are only 3.7 million mu. According to typical experiments, if peas are planted deeply and if sufficient phosphorous fertilizers are applied, good varieties will produce increased yields.

Soybeans can fix 13.5 jin of nitrogen in every mu of soil, equivalent to 67.5 jin of ammonium sulphate, half for use by the soybeans and half to nurture the land. The wilted stems and fallen leaves contain 13.5 percent crude protein. Left in the soil, this also is a very good organic fertilizer. The planting area of soybeans throughout the province increased from 3,152,200 mu in 1977 to 3,173,000 mu in 1980. In addition, chick peas, spring vicia sativa, and similar superior varieties of plants are all being studied and popularized.

The effect of fertilization of the fields by rape is being recognized increasingly. According to scientific measurements, rape that produces a per mu yield of 250 jin of rapeseed provides 260 jin of fallen leaves per mu, 600 to 700 jin of stalks, 482 jin of roots, and 200 jin of cuticles. The soil of the rape crop contains 1.09 percent organic substances; the roots, stems, and leaves are equivalent to 4 to 6 jin of pure nitrogen, or 30 jin of standard nitrogen fertilizer. The secretions of the root system can change the soil's mineral phosphorus from a state which cannot be absorbed to a state which can be absorbed. Rape cake of 130 jin that produces a per mu yield of 250 jin of rapeseeds is equivalent to 36 jin of standard nitrogen fertilizer, 24 jin of phosphorous fertilizer, and 4.8 jin of potassium fertilizer. It is true that planting a mu of rape can fertilize 2 mu of food grain fields! The area of rape throughout the province increased from 1.16 million mu in 1977 to 1.3 million mu in 1980. Fufeng County planted 35,000 mu of rape in 1977, and 70,000 mu in 1980; and it became a county with a double bumber harvest of rape and food grains in our province.

In addition, the area of planing of various types of green manure and returning stalks to the fields, and the area interplanted and companion planted with food grain crops, sweet clover, and hairy vetch are all gradually increasing.

At present, our province still has over 12.3 million mu of cultivated land consisting of poor soil. Of this area, over 900,000 mu are saline and alkaline land, over 4.3 million mu are heavy clay commonly called yellow mud, over 1.3 million mu are windy and sandy land, the Qinba mountain region has over 5.8 million mu of pebble land, and there also are cold paddy fields that are submerged under water throughout the year. The masses have devised many methods of reforming these lands. The saline and alkaline land of Xuzhuang Commune in Dali County originally produced over 100 jin per mu. They used the methods of digging trenches to lead water into the region to wash and drain away alkali, paved sand to suppress alkalinity, covered the land with soil to cover the alkali, guided flood water to silt the land, sank mechanized wells to lower the water level, increased the application of organic fertilizers, and planted beets. The per mu yield increased to 400 - 500 jin. Wangling Brigade in Ankang County treated heavy clay (yellow mud) by mixing it with fine sand and planting green manure, increased the application of organic fertilizers, and low yields became high yields. Xiaotanzi Brigade in Dingbian County treated windy and sandy soil by building a forest network to break the wind and stabilize the sand, and used loess to mix with the sand (gradually mixing to over 3 cun); thus, the per mu yield of 1,000 mu of land reached 400 - 500 jin. Many localities treated the pebble land of Qinba by upturning the soil more for weathering, planting green manure, and returning stalks to the fields to improve the soil. Many localities treated cold paddy fields that were submerged under water throughout the year by draining the water during the resting period between crops to upturn and dry the fields, or planting double cropping dryland rice to increase the ground temperature. The results were outstanding. In general, if we skillfully summarize the experience of the masses and pay attention to popularization, these poor soils can all be reformed without much difficulty.

9296
CSO: 4007/17

BRIEFS

COTTON PROCUREMENT MEETING--On 2 and 3 November, the Shaanxi Provincial Government held an on-the-spot meeting in Dali County on picking and procuring cotton. The meeting demanded that all prefectures, counties and municipalities in the cotton-producing areas concentrate their leadership bodies in spending a certain period of time on the procurement of cotton. The meeting introduced the experiences of Dali County, Qian County, (Dongwang) commune in Heyang County and (Bozhi) commune in Dali County in procuring cotton. By the end of October, Dali County had procured some 101,800 dan of ginned cotton and Qian County had procured some 25,700 dan of ginned cotton, respectively fulfilling 44.2 and 36.6 percent of their quotas. By the end of October, the province had procured some 420,000 dan of ginned cotton, which accounted for 20.9 percent of the annual quota for procurement. The amount of ginned cotton procured in the province in this period was 102,300 dan more than in the corresponding period last year. However, judging from the province's overall situation, the speed of cotton procurement in the province has been slow and the progress has been very uneven. To improve cotton procurement work, the meeting demanded that all places strengthen leadership and step up cotton procurement work. Vice Governor Bai Jinian attended and spoke at the meeting. [HK140710 Xian Shaanxi Provincial Service in Mandarin 1130 GMT 6 Nov 81 HK]

CSO: 4007/112

BRIEFS

HUANGHE RIVER DIVERSION--Owing to the drought this year, the water level of Dongping Lake, Shandong Province, has dropped severely. The Shandong Provincial CCP Committee and the provincial people's government have decided to appropriate 80,000 yuan to divert Huanghe River water to the lake in an effort to protect its aquatic resources and its irrigation capacity for the surrounding wheat fields. From 7 to 17 November, Liangshan County mobilized over 10,000 persons and completed building this water diversion channel, which is 13.9 kilometers long. On 17 November the channel was put into operation to divert water from Huanghe River. [SK281012 Jinan Shandong Provincial Service in Mandarin 2300 GMT 26 Nov 81 SK]

VEGETABLE HARVEST--Shandong Province is expected to procure 1.38 billion jin of marketable vegetables in 1981, an increase of better than 20 percent over 1980. According to statistics released by 10 cities and mining areas, the average per capita daily supply of vegetables is 1 jin and 3 liang, an increase of 1 liang over 1980. [SK110728 Jinan Shandong Provincial Service in Mandarin 2300 GMT 10 Nov 81 SK]

CSO: 4007/112

BRIEFS

YONGCHUAN PREFECTURE GRAIN PRODUCTION--Yongchuan Prefecture which was seriously struck by floods this year reaped an all-round bumper grain harvest. All eight counties throughout the prefecture increased production. The whole prefecture used superior seeds of the main spring-sown and spring-harvested crops. The per mu yield of hybrid rice on 500,000 mu was generally 100 or 200 jin more than that of conventional rice. [HK250927 Chengdu Sichuan Provincial Service in Mandarin 2300 GMT 15 Nov 81 HK]

CSO: 4007/112

BRIEFS

WINTER WHEAT SOWING--By 2 November, Xinjiang region had sown winter wheat on some 11.3 million mu, overfulfilling its quota for sowing winter wheat. The region had sown winter wheat on 15,000 mu more than last year. At present, all places are tending winter wheat well to protect it throughout winter. [HK160735 Urumqi Xinjiang Regional Service in Mandarin 1650 GMT 12 Nov 81 HK]

BUMPER HARVEST--Xinjiang region has reaped bumper harvest of cotton and oil-bearing crops this year. It is estimated that this year total output of cotton will be 2.07 million dan, 31 percent more than last year; per mu yield of ginned cotton will be 61 jin, 5 percent more than last year and the total output of oil-bearing crops will be 3.63 million dan, 3.3 percent more than last year. [HK140710 Urumqi Xinjiang Regional Service in Mandarin 1650 GMT 6 Nov 81 HK]

HUOCHENG COUNTY EXCESS GRAIN--The masses in Huocheng autonomous county have displayed their patriotic spirit by selling excess production of grain and oil-bearing crops, which had been grown in their private plots, to the state. According to incomplete statistics, as of 20 October, the commune members of the county have sold 656,000 jin of wheat and 1.53 million jin of oil-bearing crops to the state. [HK020644 Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 19 Nov 81]

CSO: 4007/114

HERDSMEN OVERCOME 'EXTRAORDINARY' SNOWFALL

OW010513 Beijing XINHUA Domestic Service in Chinese 0133 GMT 1 Dec 81

[By XINHUA correspondents Liu Yinsheng and Xie Bangmin]

[Text] Lhasa, 1 Dec (XINHUA)--Herdsmen in Nagqu Prefecture, Xizang, have made gratifying achievements in animal husbandry this year, after surmounting extraordinary snowfall rarely seen in the past. The total number of livestock registered an increase of 2 percent over last year; major animal products such as sheep's wool, butter and meat also topped last year by 15 to 20 percent. The entire pastoral area is bustling with activity for the first time since democratic reform in Xizang, signifying prosperity and unity.

In their newsgathering assignment in the grasslands of northern Xizang, the correspondents had often seen convoys of trucks laden with sheepswool and hides, columns of yaks carrying butter and salt and herds of cows and sheep hurrying to sales at the state procurement stations or to the rural areas to be traded with peasants. The herdsmen told the correspondents smilingly: We have done well, considering this year's extraordinary natural disaster, thanks to the party Central Committee's directive on work in Xizang and to the production responsibility system.

Nagqu Prefecture is a major livestock breeding base in Xizang. Since the party Central Committee's directive concerning work in Xizang was put into effect last year, the Nagqu Prefectural CCP Committee and the prefectural administrative office have consistently implemented the party's nationalities policy and consolidated and eased various policies in the pastoral areas. As a result, the people in these areas have enjoyed peace of mind and are in high spirits; the political situation is stable and the economy flourishing.

Nagqu Prefecture reported heavy snowfall last winter and spring, lasting 5 or 6 months. Some places reported snow a meter deep. Because of the long duration and extent of the snowfall, it was quite common to see cattle unable to find grass as the grazing grounds were snow covered. With one heart and one mind, the cadres and the masses voluntarily gave up their tents and blankets to warm old, weak and young animals, fed them with their own food grain and tea leaves and shifted the grazing grounds by every method to greatly minimize loss of cattle.

At present, the broad masses of herdsmen in Nagqu Prefecture are actively storing up grass and are selling and trading animal products.

CSO: 4007/112

BRIEFS

FOREST OWNERSHIP CERTIFICATES--In order to further implement the agricultural policies, the Xizang Regional People's Government recently decided to issue forest ownership certificates and issued a circular on this. The circular pointed out: Commune members who plant trees around their houses or in fixed areas allocated by the production teams can permanently own the trees. Forest ownership certificates should be issued to all tree farms. The forest ownership certificates will be printed by the regional forestry bureau and distributed by the respective county people's governments. [OW031005 Lhasa Xizang Regional Service in Mandarin 1130 GMT 6 Nov 81 HK]

CSO: 4007/112

BRIEFS

DALI BAI AUTONOMOUS PREFECTURE PRODUCTION--Dali Bai autonomous prefecture increased production of grain, oil-bearing crops, flue-cured tobacco and sugarcane this year. The autonomous region suffered from serious plant diseases and insect pests earlier this year and spring-harvested crop production dropped by 65 million jin. In order to overcome disaster and increase production, the autonomous prefectural leaders organized work teams to go to the lower levels of the rural areas to implement various economic policies and consolidate and perfect various production responsibility systems. As a result, the total grain production this year is expected to exceed the production record by 1.21 percent, oil-bearing crops production will increase by 93 percent over last year, flue-cured tobacco by 11.8 percent, and sugarcane by 24 percent. [HK020644 Kunming Yunnan Regional Service in Mandarin 1100 GMT 19 Nov 81]

CSO: 4007/114

BRIEFS

LISHUI PREFECTURE AGRICULTURAL DEVELOPMENT--Lishui Prefecture in Zhejiang Province has steadily developed agriculture and forestry. Expects to harvest 1.5 billion jin grain and has afforested 275,000 mu this year. [OW021325 Hangzhou Zhejiang Provincial Service in Mandarin 1040 GMT 29 Nov 81]

CSO: 4007/114

Agriculture Research

AUTHOR: XIE Weiyue [6200 4850 1971]

ORG: Xiangyang Prefecture Research Institute of Agricultural Sciences

TITLE: "Preliminary Investigation Into Factors Influencing the Grain Weight of Wheat"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 10, Oct 81 pp 1-4

ABSTRACT: Under the condition of 300 thousand spikes/mu and 35 grains/spike on the average, the increase of every one g of the grain test weight [per 1000 grains] means a yield increase of 21 jin of wheat/mu. The effects of the weather, and cultivation conditions (including planting time, density, and fertilizer application) on the weight of the grains are examined in detail based upon the experimental data of the institute, 1955-76, using current breeds of wheat, such as Nanda-2419, Xiang mo No 4, Yibing No 1, Omo No 6, etc. Results indicate that aside from various natural factors after infloresconce, the weight of grains is also greatly affected by the cultivation and management conditions throughout the growth and development period of the wheat. Accordingly, measures concerning timely planting, reasonable density, lodging prevention, additional fertilizer application, flood and drought prevention, disease and pest prevention and control, and timely harvest and threshing that are favorable for increasing the dry weight of the grains are proposed.

AUTHOR: XUAN Xiuzhi [6513 4423 5347]

ORG: Geothermal Experimental Station, Yingshan County

TITLE: "Physiological Characteristics and Cultivation Technique of Paddy Rice of Geothermal Greenhouse"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 10, Oct 81 pp 8-12

ABSTRACT: Since 1971, the author and colleagues have carried out 9 winter-spring seasons of repeated experiments with the use of geothermal greenhouse to cultivate paddy rice. The greenhouse is used to adjust the blooming time of early, intermediate, and late rice breeds freely to expand the range of selection of parents for hybridization. In 1972-76, more than 200 groupings were tried and 3 generations of propagation were successfully carried out in one year. Under the short daylight condition in the winter, the rice breeds have shorter period of growth and development and require less effective accumulation of temperature when they are cultivated in the greenhouse. When sprir [illegible] er containing sodium sulfate is used to water the rice plants in the greenh [illegible] or a prolonged period of time and the soil pH reaches 8-9, the seedlings wil [illegible] harmed and the only way to overcome the problem is to replace the soil and not to use the spring water. Various other important techniques of greenhouse culture of paddy rice are discussed. There is no mention of the source of the heat energy or the structure of the greenhouse, however.

AUTHOR: ZHU Qisheng [4376 0366 0524]

ORG: Soil and Fertilizer Center, Hubei Provincial Academy of Agricultural Sciences

TITLE: "Preliminary Research on the Fertility Supplying Capacity of the Soil of Huangnitian and the Effect of Fertilizer Application"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 10, Oct 81 pp 16-18

ABSTRACT: Huangnitu [soil of Huangnitian, a field of yellow mud] is one of the major cultivated soils in Hubei, amounting to 20 percent of cultivated area of the province, i.e. about 12,808 thousand mu. Of these, 4,360 thousand mu are paddies and 8,448 thousand mu are dry fields, amounting to 14.7 and 24.5 percent of the province's paddies and dry fields respectively. The regions of its extensive distribution are also important production bases of grain, cotton, and oil of the province. At present, the yield of Huangnitu is generally not high, with unit yield of only 300-400 jin/mu of rice, or 100-200 jin/mu of wheat, or several tens of jin/mu of ginned cotton. A study, combining small-plot field experiment and laboratory analyses, has been conducted since 1979. The test crops are dual-season rice-green manure. The field experiment is divided into 6 forms: (1) control, with no fertilizer application; (2) basic fertilizer of 2500 jin green manure/mu; (3) basic fertilizer + nitrogen, i.e. (2) + 12 jin/mu of N; (4) basic fertilizer + nitrogen-phosphorus, i.e. (3) + 6 jin of P_2O_5/mu; (5) basic fertilizer + nitrogen-potassium, i.e. (2) + 12 jin of K_2O/mu; (6) basic fertilizer + nitrogen-phosphorus-potassium, i.e. (5) + 6 jin of P_2O_5/mu. Organic matter, pH, nitrogen, phosporus, and potas-

[continuation of HUBEI NONGYE KEXUE No 10, 1981 pp 16-18]

sium contents of Huangnitu specimens are analysed before the experiment and after the harvest of the experimental crop every season. Rice plants are analysed to compute the rate of absorption of nitrogen, phosphorus, potassium, and the fertilizer utilization rate. The fertilizer application benefit is further examined by combining the laboratory analysis results and growth condition and the yield of rice in the field. Results indicate that the productivity of Huangnitu is rather low and the yield of rice depends mainly on fertilizer. Utilization of chemical nitrogen is 46.1 percent for early rice and 60.6 percent for late rice. With added phosphorus, the rate is raised to 60.6 percent for early rice but only 61.3 percent for late rice. At present, potassium fertilizer has not demonstrated any yield increase results. Application of green manure appears to be the low cost,and highly beneficial measure for yield increase in Huangnitu. Details of the experiment are reported.

AUTHOR: YIN Huadian [1438 0553 0368]
LI Yingxiang [2621 4481 3276]
WANG Guofan [3769 0948 5400]
ZHANG Gengxin [1728 5087 1800]
LEI Jianbao [7191 0256 0202]
LIAO Rencai [1675 0088 1752]
TAO Jun [7118 6874]

ORG: YIN, LI, WANG of Zhumadian Prefecture Veterinary Hospital, Henan Province; ZHANG, LEI of Huazhong College of Agriculture; LIAO, TAO of Hengyang Branch, Hunan College of Agriculture

TITLE: "Diagnosis of Rabies of Domestic Animals in Zhumadian Prefecture of Henan Province"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 10, Oct 81 pp 32-34

ABSTRACT: Since the autumn of 1980, cases of suspected rabies have been continuously discovered among domestic animals in Zhumadian Prefecture. In all cases, treatment produced no effect and the animals died. According to incomplete statistics of several animal hospitals, in Jan-May this year, 16 oxen, 8 sheep, 3 pigs, 1 donkey, 2 mules, and 2 dogs died of the disease in the prefecture. Epidemiological surveys, clinical symptoms, animal experimental inoculations, and laboratory examination of brain tissues all verify the diagnosis of rabies to be correct.

6248
CSO: 4009/113

AUTHOR: HUA Suolong [5363 6956 7893]

ORG: Subtropical Forestry Research Institute, Chinese Academy of Forestry Science

TITLE: "A Study on the Pathogen of Blight Disease of Tungoil Trees"

SOURCE: Nanjing NANJING LINCHAN GONGYE XUEYUAN XUEBAO [JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS] in Chinese No 3, Sep 81 pp 45-53

TEXT OF ENGLISH ABSTRACT: The blight disease of tungoil trees is generally called tungoil tree pestilence. It is a vascular disease caused by a new formae speciale of *Fusarium oxysporum*, *Fusarium oxysporum* Schl. *f. sp. aleuritidis f. sp.* Nov. This disease is found in China in Jiangxi, Zhejiang, Hunan and Sichuan, etc., provinces. It usually attacks the three to four year old tungoil trees, or the older ones. The pathogen enters the host plant through its roots, multiplies in its vessels and gradually extends upward to parts of the plant above ground, thus causing the whole or half of the plant to die. The highest infection rate of tungoil trees may reach 60-90 percent. It is a destructive disease and seriously threatens the production of tungoil trees.

Much of the pathogen has been isolated and cultured, inoculated and reisolated. It belongs to *Fusarium oxysporum* according ot its morphological features.

[Continuation of NANJING LINCHAN GONGYE XUEYUAN XUEBAO No 3, Sep 81 pp 45-53]

Host plants of the pathogen include 64 species in 29 families. No other species is attacked. In view of its highly selective pathogenicity to host and the rule for international nomenclature that the name of the formae speciales should correspond to that of the host, the author suggests that the pathogen on tungoil trees be called *Fusarium oxysporum* Schl. *f. sp. aleuritidis f. sp.* Nov.

The spores of the pathogen can germinate normally in clean water with a pH value of 3-12. When the relative humidity is lower than 80 percent, spores fail to germinate. Optimum temperature for germination is 25-30°C. Carbonic and phosphorous nutrient elements are not especially required for the growth of the pathogen, but nitrogen is necessary.

AUTHOR: FENG Jinchen [7458 2516 5256]
ZHAO Rongtang [6392 2837 1016]

ORG: Both of Nanjing Technological College of Forest Products

TITLE: "A Study on the Compression Processing of the CCT Data Gathered by Land Satellites"

SOURCE: Nanjing NANJING LINCHAN GONGYE XUEYUAN XUEBAO [JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS] in Chinese No 3, Sep 81 pp 98-114

TEXT OF ENGLISH ABSTRACT: With the aid of electronic computers, data compression processing is an important technique used for recognizing the pattern of remote sensing images. In this paper, the Karhunen-Loeve transformation and the R-Factor Analysis have been used in compression-processing the multi-spectrum data on the land satellite Computer Compatible Tape (CCT). As a result, with about 99 percent of the information being kept, the characteristic quantities can be compressed from four dimensions into two dimensions, so that a picture with clusters of dots can be made on a sheet of paper for recognizing and defining the objects.

9717
CSO: 4009/140

END

END OF FICHE

DATE FILMED

Dec. 15, 1981